

ISS Photographic Opportunities Overview

Joby Minor

International Space Station

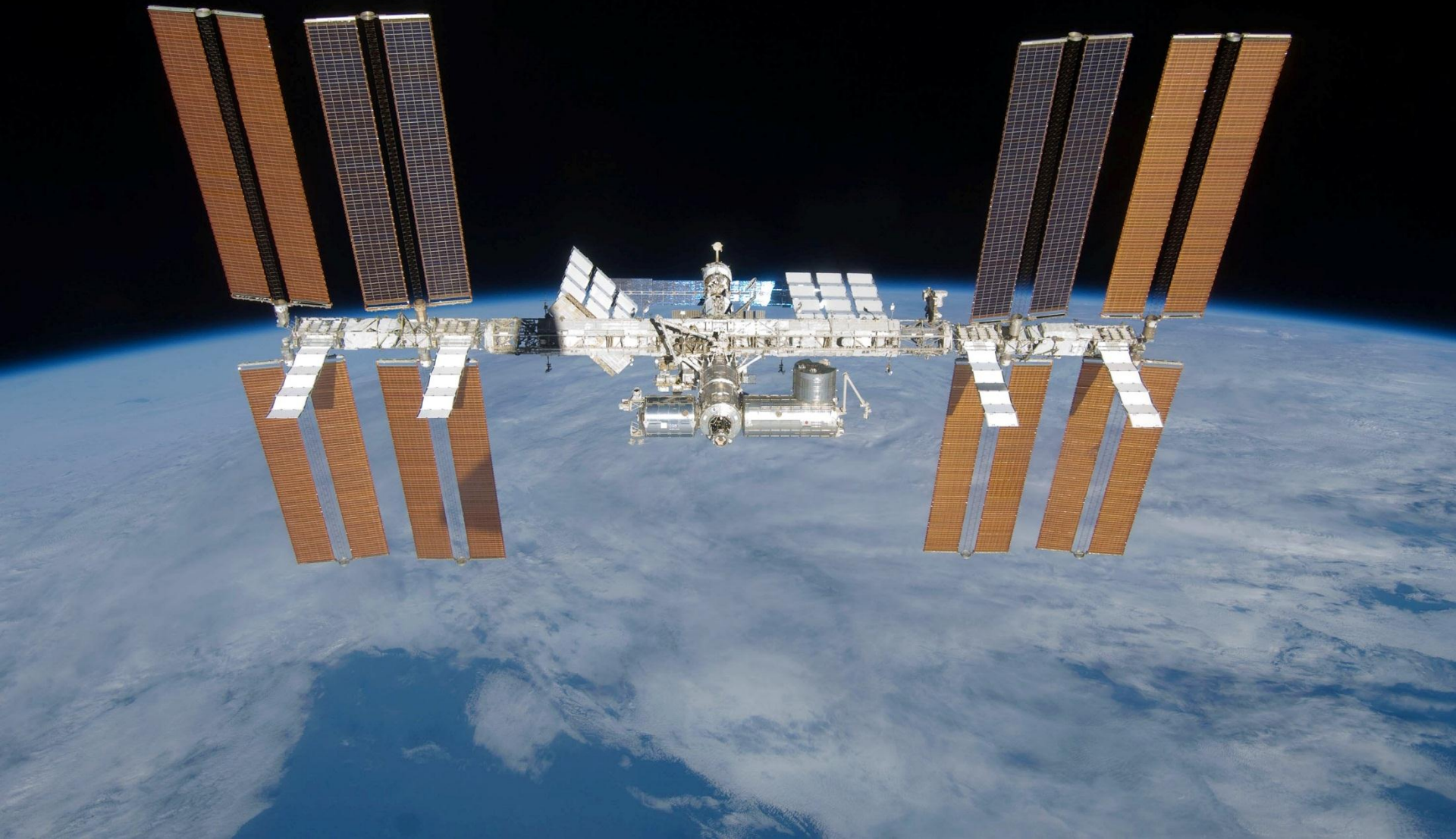
Payload Operations Director

NASA Marshall Space Flight Center

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International Space Station





We are...

ISS Payload Operations Integration Center
NASA Marshall Space Flight Center
Huntsville, AL
"1 of 6 Mission Control Centers in the World"

- Operate 24/7/365 – even on Christmas
- Rotate three shifts per day
- Responsible for all US payload activity
 - NASA
 - CASIS (National Lab)
 - Russians run their own science program
 - Internal/external
 - Crew tended/ground commanded/autonomous
- Payload Operations Director (POD – me!)
 - Manages certified Flight Controllers in Huntsville
 - Answers to Flight Director in Houston
 - Coordinates activities for International Partners
 - European Space Agency (ESA) & Japanese Space Agency (JAXA)

International Space Station

- Assembly Complete in 2011
- Russian / US segments
- 16 member nations on US side
- Altitude = 250 nautical miles (+ / -)
- Speed = 17,500 mph
- Science investigations in:
 - Human health
 - Combustion
 - Materials science
 - Fluids science
 - Robotics
 - Tech demos
 - Plant growth
 - *...and PHOTOGRAPHY!*



ISS is a photographer's paradise:

- *Windows on top of the world*
- *Still photography / HD video*
- *Extra-Vehicular Activity (EVA)*
- *Crew tended and/or ground commanded by Principle Investigator*

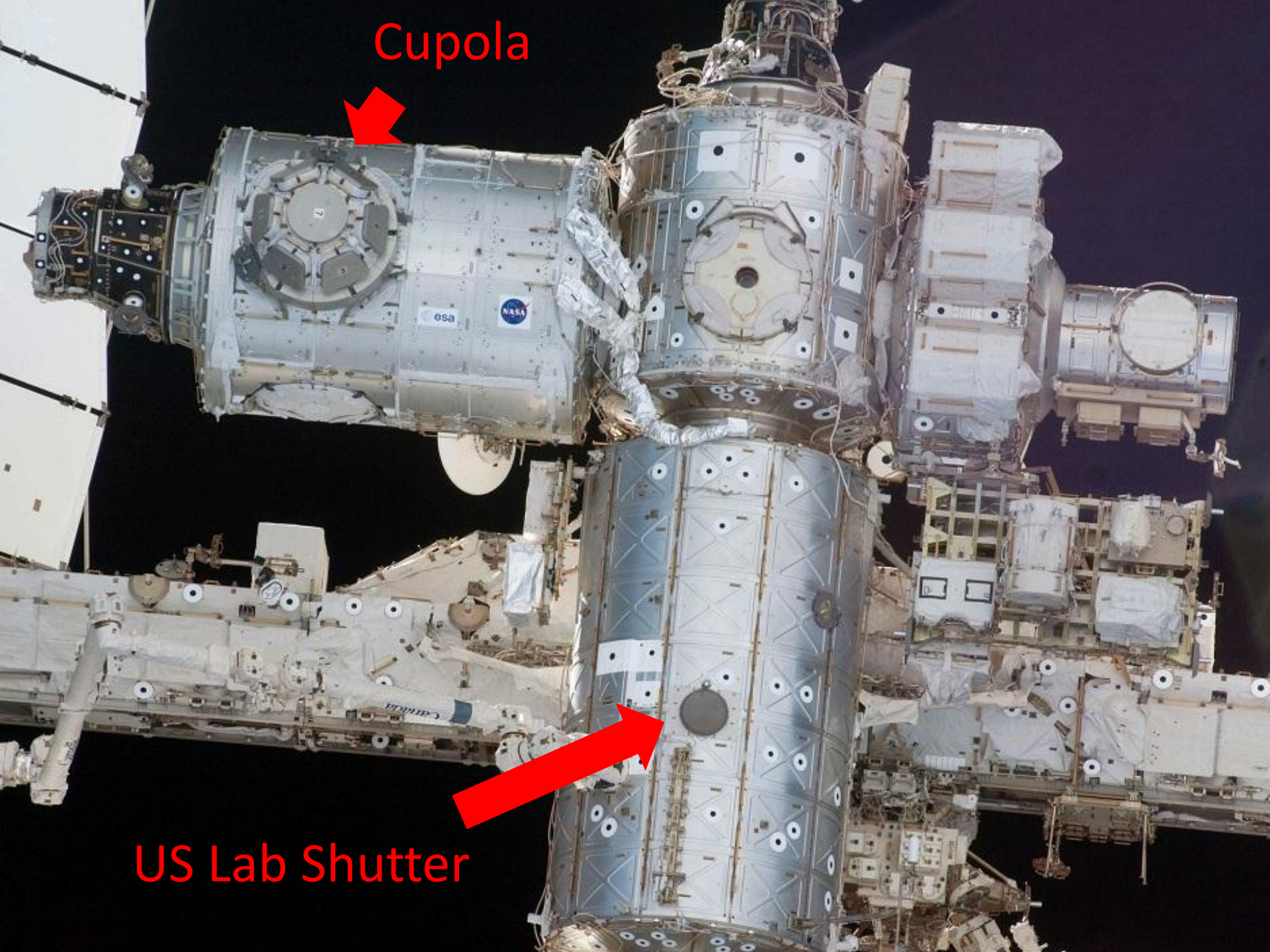


- Exclusively High-End Nikon D series
- Wide-angle / Telephoto Lenses
- Compact Flash (CF) Cards
- Dozens of camera bodies onboard
- Science/systems/personal use
- Routinely updated every few years

Cupola



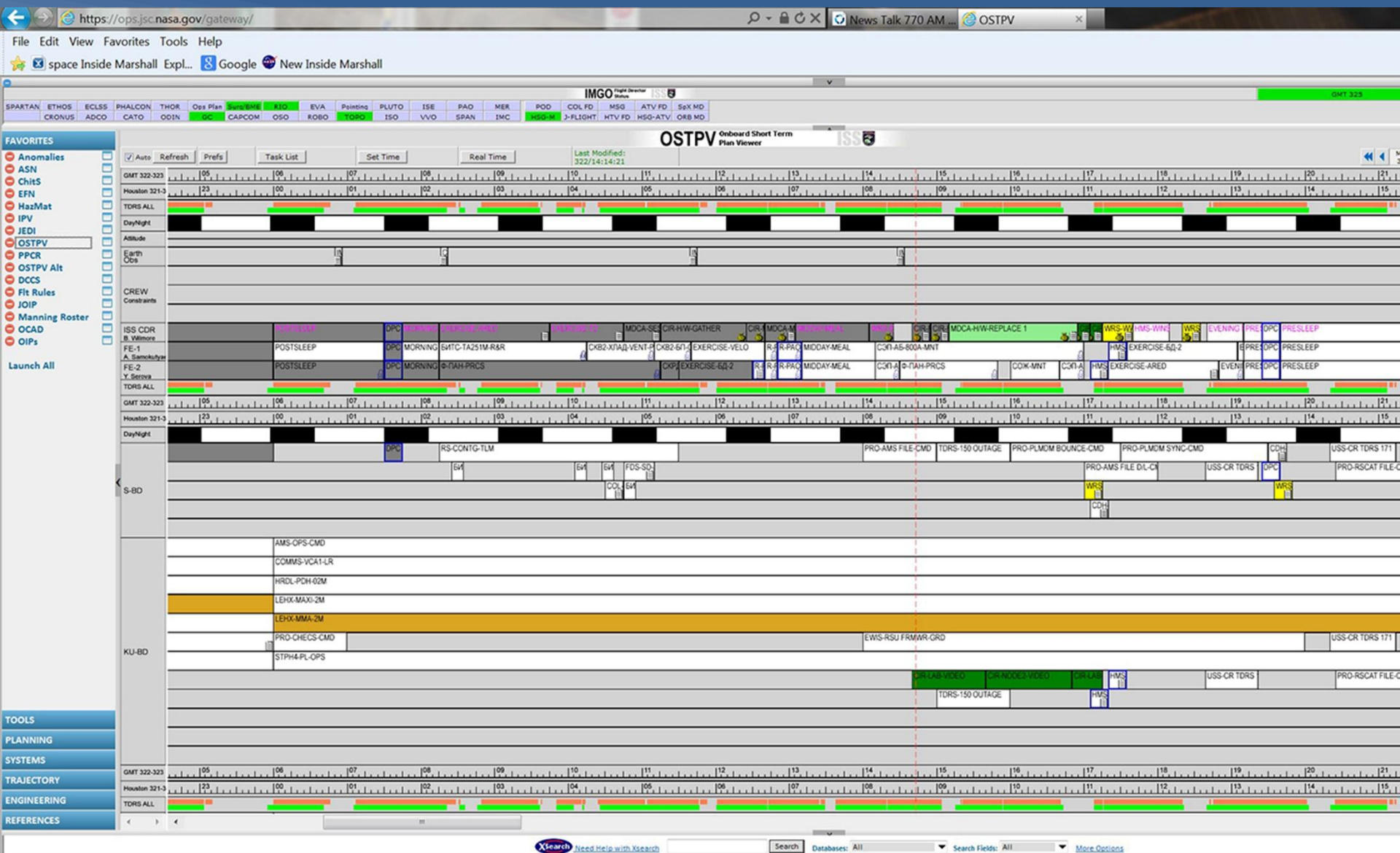
US Lab Shutter



Crew-Tended Photography



How Does The Crew Know When To Take Pictures?



Of What Does The Crew Take Pictures?



Russian Service Module Windows



Ground Commanded Photography

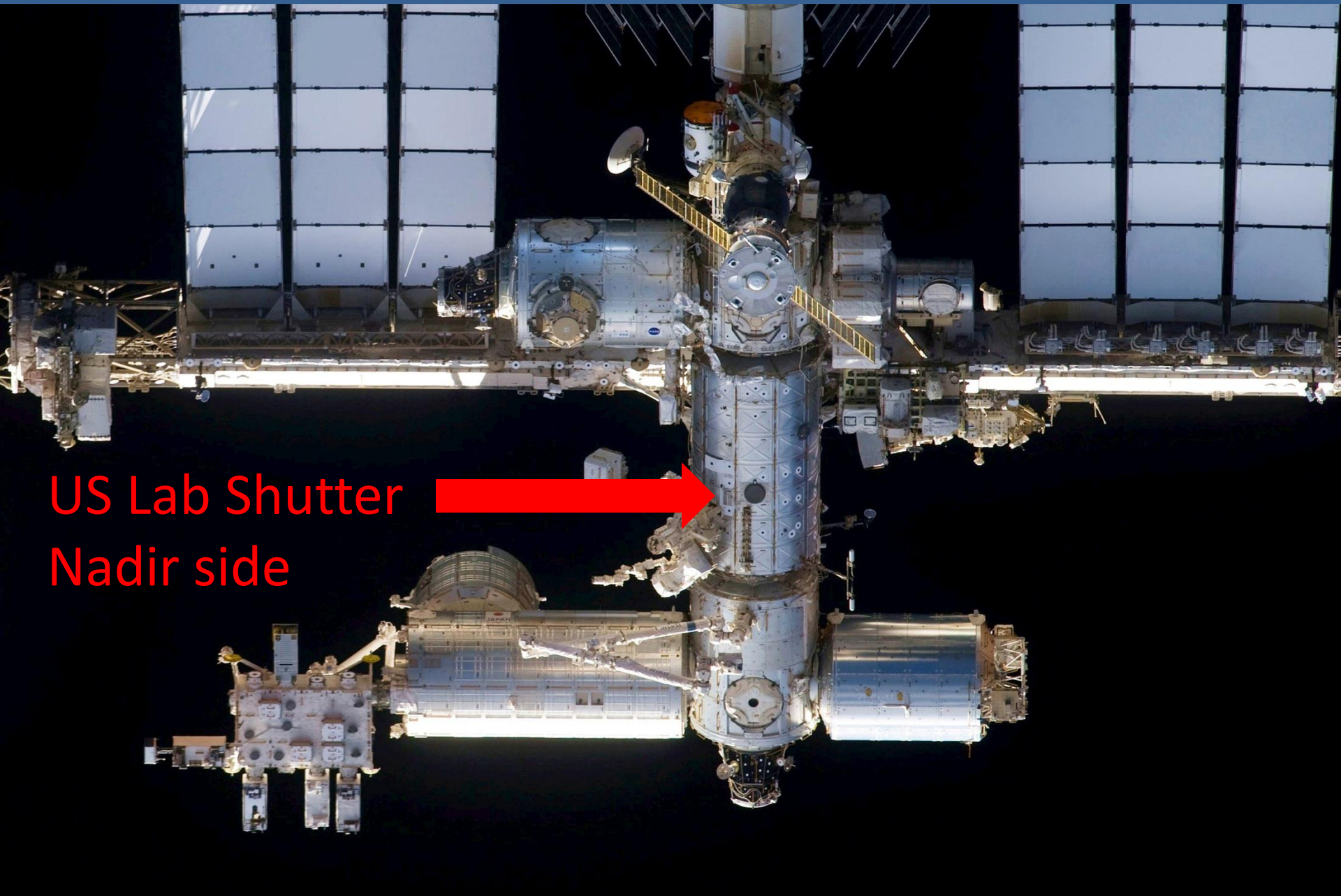


Window Observational Research Facility
(WORF)

WORF

- Payload Rack Assembly dedicated to Earth obs
- Located in US Lab (Destiny)
- Student-led payload ops
- ISSAC, EKAM, ISERV
- Crew sets up h/w but students operate
- Payload connected to ISS Ethernet system so that students command directly to payload.





US Lab Shutter
Nadir side



- LAB Shutter is manual/ground commanded
- Student controlled

- Multiple payloads ops
- Laptop PCs control cameras



Video Cameras

- **Multiple video cameras available everywhere**
 - US LAB, Columbus Module (ESA), Japanese Experiment Module (JEM)
 - Hard mounted/ground controlled
 - Free flying/crew controlled
 - HD/SD
- **Used for:**
 - Science
 - Crew Conferences w/ family, physicians, etc.
 - Public Affairs Office (PAO) events
 - Russians also use our video cameras
 - Signal sent down via Ku-Band (OSTPV)
 - Can be restricted, if necessary.
- **Updated on same schedule as still cameras**



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<http://www.nasa.gov/station>

Space Station for Researchers

Space Station for Educators

<http://www.youtube.com/watch?v=hyn1We0wOT8>

YouTube ISS video tour



